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Butler Manufacturing
Research Center
13500 Botts Road
Grandview, MO 64030-2897
Phone 816-968-5700

ASTM C 1363
Thermal Performance Test Report

Test Number: 2011-34
Sponsor: North American Insulation Manufacturers Association

Wall Liner System 1/8" Foam Tape R-30

Butlerib® II wall system panel, 1/8" foam tape on outside flange of girts, nominal R-30 fiberglass blanket between girts, WMP-30 vapor retarder

Test Date: 5/23/2011

Responsible Party: Mark J. Henry
Operator: Larry Krueger
Witness: Mark Henry

Summary of Results:

Thermal Transmittance*, U:	0.297 W/m^2 K (0.052 Btu/ hr ft^2 F)
Overall Thermal Resistance, Ru:	3.4 m^2 K/W (19.2 hr ft^2 F/Btu)

*air-to-air thermal transmittance

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ASTM C 1363 Thermal Performance Test Report Summary

Prepared For:
North American Insulation Manufacturers Association
44 Canal Center Plaza
Suite 310
Alexandria, Virginia 22314

Test Number: 2011-34
Test Start Date: 5/23/2011
Test End Date: 5/27/2011
Report Date: 5/31/2011

Test Information:
Wall Liner System 1/8" Foam Tape R-30
Butlerib® II wall system panel, 1/8" foam tape on outside flange of girts, nominal R-30 fiberglass blanket, WMP-30 vapor retarder

Test Orientation / Heat Flow Direction:
Vertical Wall / Inside to Outside

Specimen Size:
2.44 m x 3.05 m (8.00 ft x 10.00 ft)

Test Procedure: The Thermal Transmittance (U) and Thermal Resistance (Ru) were determined in general accordance with ASTM C 1363-05, *Standard Test Method for Thermal Performance of Building Materials and Envelope Assemblies by Means of a Hot Box Apparatus.*

ASTM Exceptions, if any:

Summary of Test Setup:

Average Warm Side Ambient Temperature	37.80 deg C (100.04 deg F)
Average Cold Side Ambient Temperature	10.03 deg C (50.05 deg F)
Average Warm Side Air Velocity	0.30 m/s (58.26 fpm)
Average Cold Side Air Velocity	1.28 m/s (252.21 fpm)

Summary of Results:

Thermal Transmittance*, U:	0.297 W/m^2 K (0.052 Btu/ hr ft^2 F)
Overall Thermal Resistance, Ru:	3.4 m^2 K/W (19.2 hr ft^2 F/Btu)

*air-to-air thermal transmittance

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Specimen Size: 2.44 m x 3.05 m (8.00 ft x 10.00 ft)
Panel Type: Butlerib® II wall system panel
Insulation: Single layer fiberglass
Framing System: Zee girts

Specimen Construction: The girts were installed in the test frame. The foam tape was a placed on the outside flange. Sections of Insul-Hold insulation supports were attached to the girts by bending one end over the girt flange lip. The wall panels were installed to the girts in a manner typical of standard installation details. The test frame was rotated to vertical. Pieces of nominal R-30 unfaced fiberglass insulation were cut to length and width. They were placed between the girts, and between the frame and the girts. The insulation butted against the girt webs and the inside of the frame. Double stick tape was placed on the inside face of the inside girt flanges. One end of the vapor retarder was fastened to the inside of the upper side of the test frame. The vapor retarder hung down, was smoothed against the insulation, and was adhered to the double stick tape. The lower end of the vapor retarder was fastened to the inside face of the lower side of the test frame. The 1” banding was installed. It was fastened to each girt. The perimeter of the panels and the side laps were taped to prevent air leakage.

Specimen Conditioning: The assembly was built at the Butler Research Center and remained there until it was tested. The insulation was unrolled and was in environmental conditions for at least 12 hours before being enclosed in the test assembly. The insulation was "fluffed" in a manner similar to the NAHB procedure for quality testing of faced insulation, in order to promote the recovery of the insulation thickness. The average measured thickness of the insulation was 9.44 inches.

Materials Used:

Material Name	Description
Butlerib Wall Panels	Butlerib II wall system panels, 26 gauge, Galvalume Plus® finish
Foam Tape	VentureTape® 9108 1/8” x 3” polyethylene foam tape Adhesive coated on two sides
R-30 Fiberglass Unfaced	Nominal R-30 unfaced fiberglass CertainTeed Commercial Blanket Insulation Measured thermal resistance: 30.88 hr ft^2 F/Btu
Vapor Retarder	Lamtec WMP-30 Polypropylene scrim kraft membrane

Sources for Materials Used: Butler Manufacturing supplied the girts, the wall panels, and fasteners.
CertainTeed Corporation supplied the fiberglass insulation.
NAIMA supplied the foam tape.
Lamtec® Corporation supplied the vapor retarder.

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Measured Test Data

Test Times	
Test Start Time	5/23/2011 8:12 AM
Test End Time	5/27/2011 7:18 AM
Time Required to Reach Steady State	53.8 Hours
Steady State Start Time	5/25/2011 2:00 PM
Steady State End Time	5/25/2011 7:54 PM

Test Information	
Metered Area	10.48 m^2 (112.75 ft^2)
Specimen Area	7.43 m^2 (80.00 ft^2)
Average Warm Side Ambient Temperature	37.80 deg C (100.04 deg F)
Average Cold Side Ambient Temperature	10.03 deg C (50.05 deg F)

Input	**84.19 watts (287.25 Btu/hr)**
Warm Side Heaters	74.10 watts (252.84 Btu/hr)
Warm Side Fans	8.82 watts (30.10 Btu/hr)
Warm Side AVT & RH Sensor Power	1.26 watts (4.32 Btu/hr)

Loss	**22.97 watts (78.39 Btu/hr)**
Surround Panel and Flanking Loss	19.85 watts (67.73 Btu/hr)
Side of Test Specimen Frame Adjustment	3.14 watts (10.71 Btu/hr)
Meter Wall and Flanking Loss	-0.01 watts (-0.05 Btu/hr)
Thermopile Voltage (E)	-0.234 mV
Thermopile Null (E_0)	-0.2418 mV
Thermopile Slope (m)	-1.8296

Total Heat Flow Through Test Specimen	**61.21 watts (208.86 Btu/hr)**

Calculated Thermal Properties	
Specimen Thermal Transmittance (U)	0.297 W/m^2 K (0.052 Btu/ hr ft^2 F)
Specimen Overall Thermal Resistance (Ru)	3.4 m^2 K/W (19.2 hr ft^2 F/Btu)

The estimated uncertainty of the results is ±5 %

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Measurements were taken to determine the depth of the insulation. They were taken on the inside from a line at the back of the test frame to the vapor retarder. The test frame is 11-5/8" deep. The flat of the wall panel was flush with the outside of the tests frame. So the measurement subtracted from 11-5/8" is the depth of the insulation from the panel flat. The measurements were taken at 6" increment across the width of the specimen. They were taken at mid-span between the girts.

Location		0.5'	1.0'	1.5'	2.0'	2.5'	3.0'	3.5'	4.0'	4.5'	5.0'	5.5'	6.0'	6.5'	7.0'	7.5'
Mid-span	Meas.	2.13	2.56	2.31	2.00	1.88	2.00	1.88	1.88	1.88	2.00	1.75	1.75	1.88	2.13	2.13
	Depth	9.50	9.06	9.31	9.63	9.75	9.63	9.75	9.75	9.75	9.63	9.88	9.88	9.75	9.50	9.50

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Specimen surface measurements.

Thermocouple Location	Avg. deg C	Avg. deg F
Test Specimen Surface (Climate) # 11	10.62	51.11
Test Specimen Surface (Climate) # 12	10.67	51.21
Test Specimen Surface (Climate) #13	10.78	51.41
Test Specimen Surface (Climate) # 14	11.27	52.29
Test Specimen Surface (Climate) # 15	12.04	53.68
Test Specimen Surface (Climate) # 16	13.44	56.20
Test Specimen Surface (Climate) # 17	11.27	52.29
Test Specimen Surface (Climate) # 18	11.70	53.05
Test Specimen Surface (Climate) # 19	10.40	50.71
Test Specimen Surface (Climate) # 20	10.45	50.81
Test Specimen Surface (Climate) # 21	10.43	50.77
Test Specimen Surface (Climate) # 22	10.54	50.98
Test Specimen Surface (Climate) # 23	10.96	51.72
Test Specimen Surface (Climate) # 24	11.85	53.33
Test Specimen Surface (Climate) # 25	13.45	56.22
Test Specimen Surface (Climate) # 26	10.83	51.50
Test Specimen Surface (Climate) # 27	10.84	51.50
Test Specimen Surface (Climate) # 28	10.14	50.25
Test Specimen Surface (Climate) # 29	10.30	50.53
Test Specimen Surface (Climate) # 30	10.19	50.34
Test Specimen Surface (Meter) # 49	37.39	99.30
Test Specimen Surface (Meter) # 50	37.48	99.46
Test Specimen Surface (Meter) # 51	37.44	99.40
Test Specimen Surface (Meter) # 52	36.35	97.44
Test Specimen Surface (Meter) # 53	36.29	97.32
Test Specimen Surface (Meter) # 54	36.60	97.87
Test Specimen Surface (Meter # 55	31.56	88.80
Test Specimen Surface (Meter) # 56	31.74	89.12
Test Specimen Surface (Meter) # 57	37.05	98.70
Test Specimen Surface (Meter) # 58	37.11	98.79
Test Specimen Surface (Meter) # 59	37.04	98.68
Test Specimen Surface (Meter) # 60	37.06	98.71
Test Specimen Surface (Meter) # 61	35.99	96.78
Test Specimen Surface (Meter) # 62	36.22	97.19
Test Specimen Surface (Meter) # 63	35.74	96.33
Test Specimen Surface (Meter) # 64	31.11	88.00
Test Specimen Surface (Meter) # 65	30.87	87.56
Test Specimen Surface (Meter) # 66	36.91	98.44
Test Specimen Surface (Meter) # 67	36.95	98.52
Test Specimen Surface (Meter) # 68	37.02	98.64

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Accreditations:

Test Specification	Description	Accredited By
ASTM C 1363-05	ASTM C 1363-05	International Accreditation Service, Inc.

Latest Apparatus Calibration Date: August 2010

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For Butler Manufacturing

Mark J. Henry
Senior Research Engineer

Attachments:

Revision Log

Rev #	Date	Page(s)	Revision(s)
Original	5/31/2011	All	

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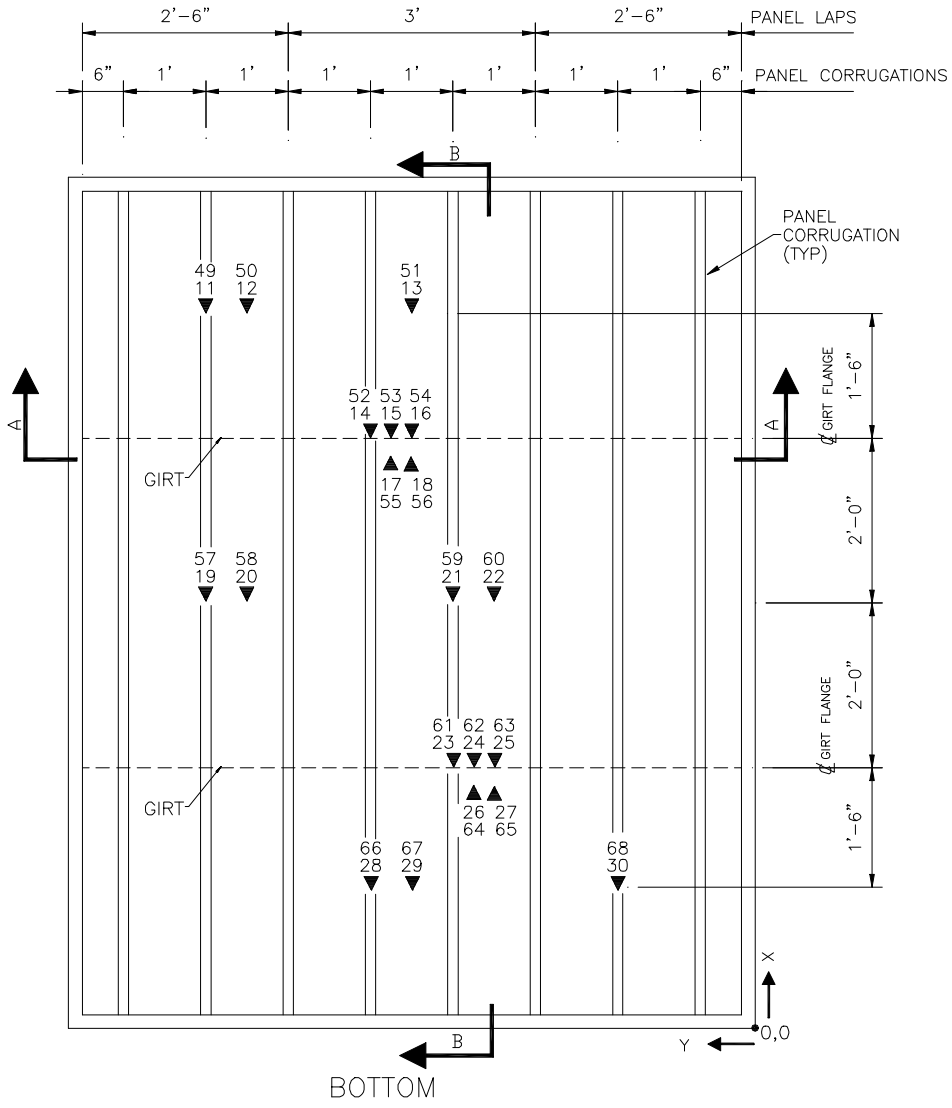
DRAWING A – ELEVATION
NAIMA WALL LINER SYSTEM 1/8" FOAM TAPE R–30



NOTES

(TC) 11 THUR 30 ARE ON THE CLIMATE SIDE SURFACE
(TC) 49 THRU 68 ARE ON THE METER SIDE SURFACE
▼## INDICATES LOCATION OF THERMO COUPLES (TC)

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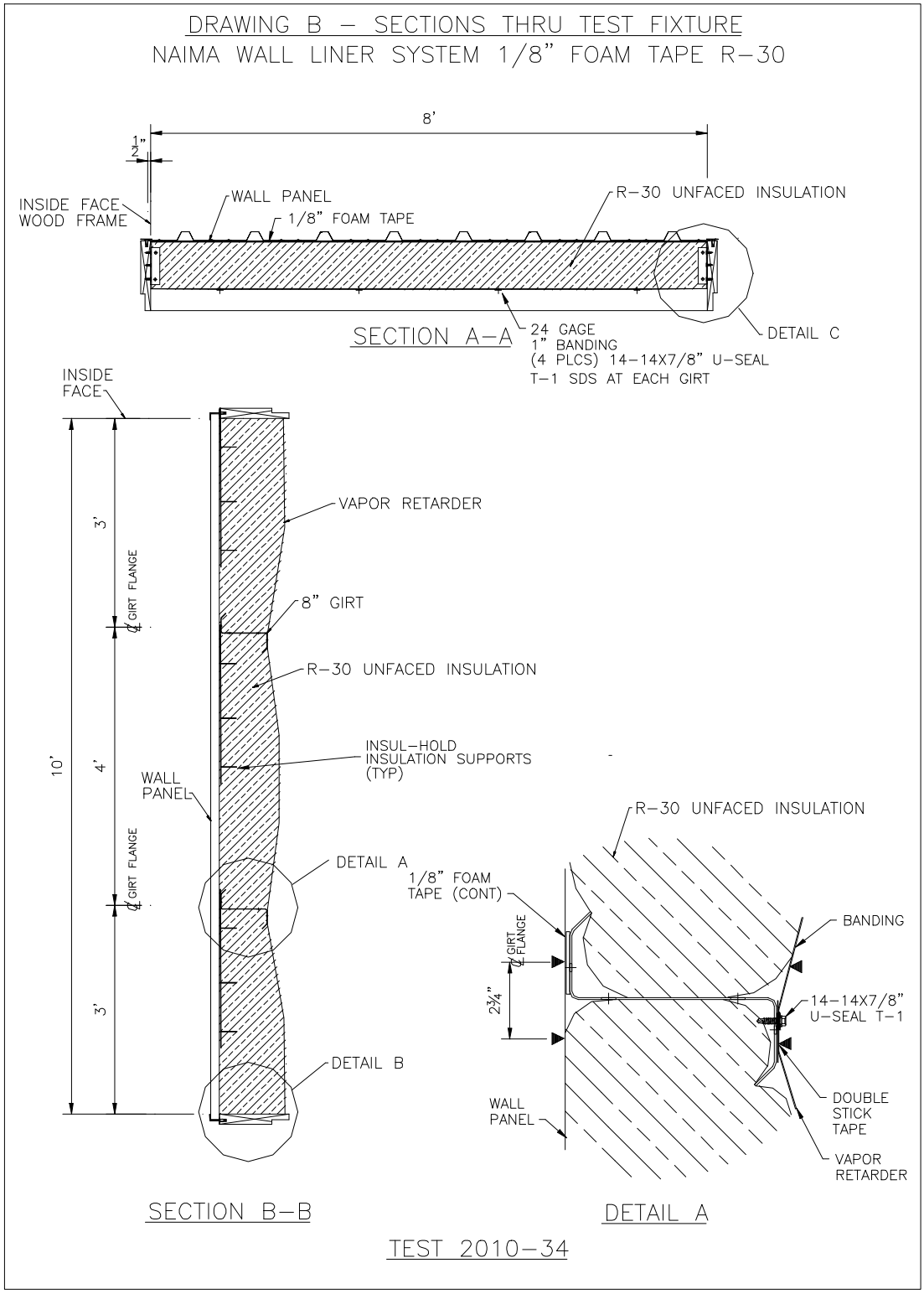

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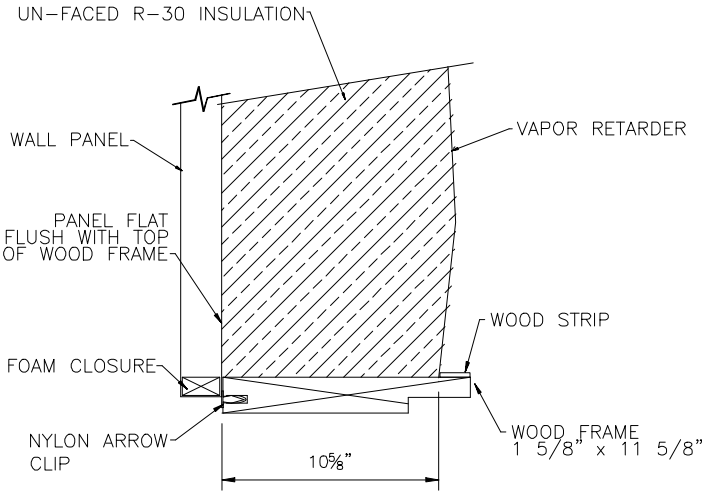
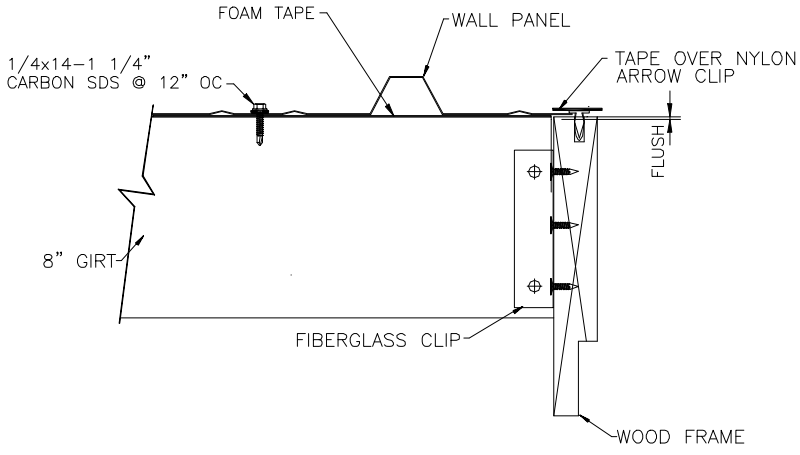
DRAWING C – TEST FIXTURE DETAILS
NAIMA WALL LINER SYSTEM 1/8" FOAM TAPE R–30



DETAIL B



DETAIL C
(INSULATION NOT SHOWN)

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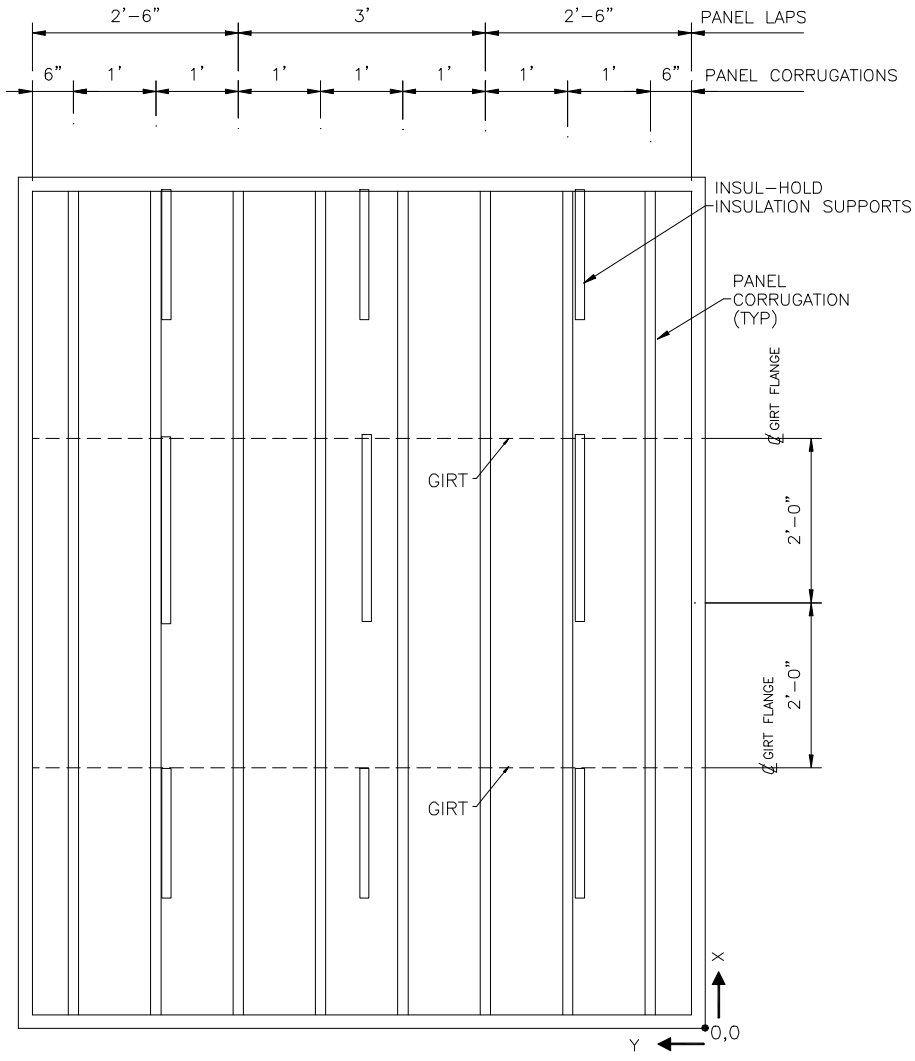
DRAWING D – INSULHOLD LOCATIONS
NAIMA WALL LINER SYSTEM 1/8" FOAM TAPE R–30



BOTTOM

TEST 2010–34

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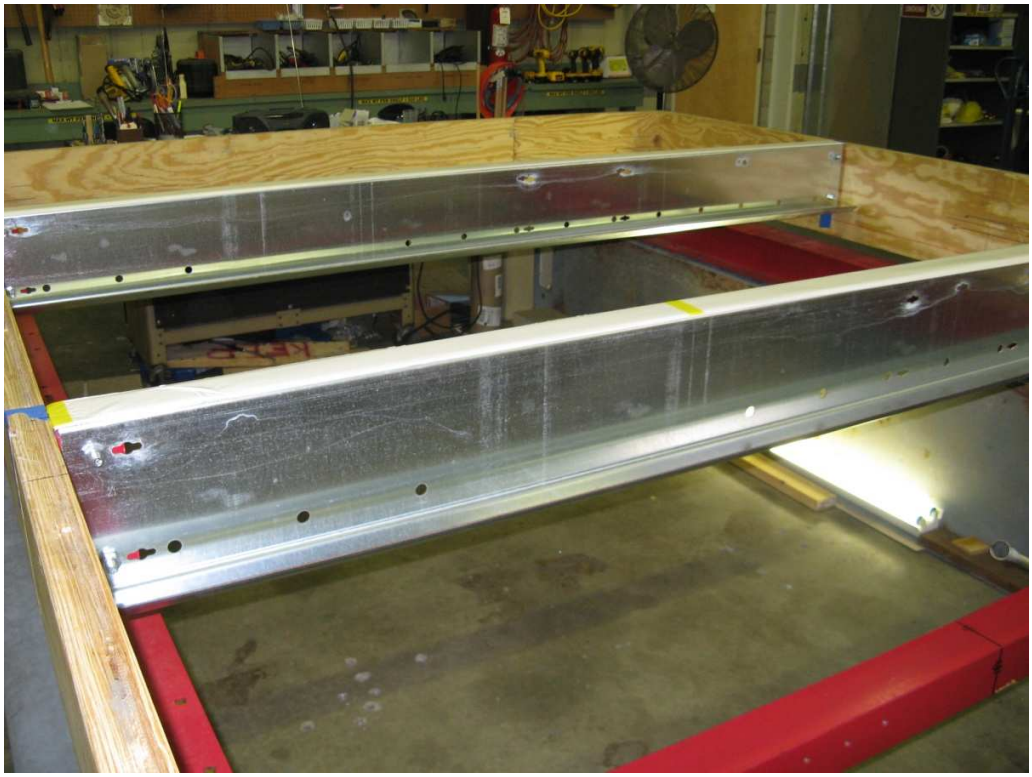

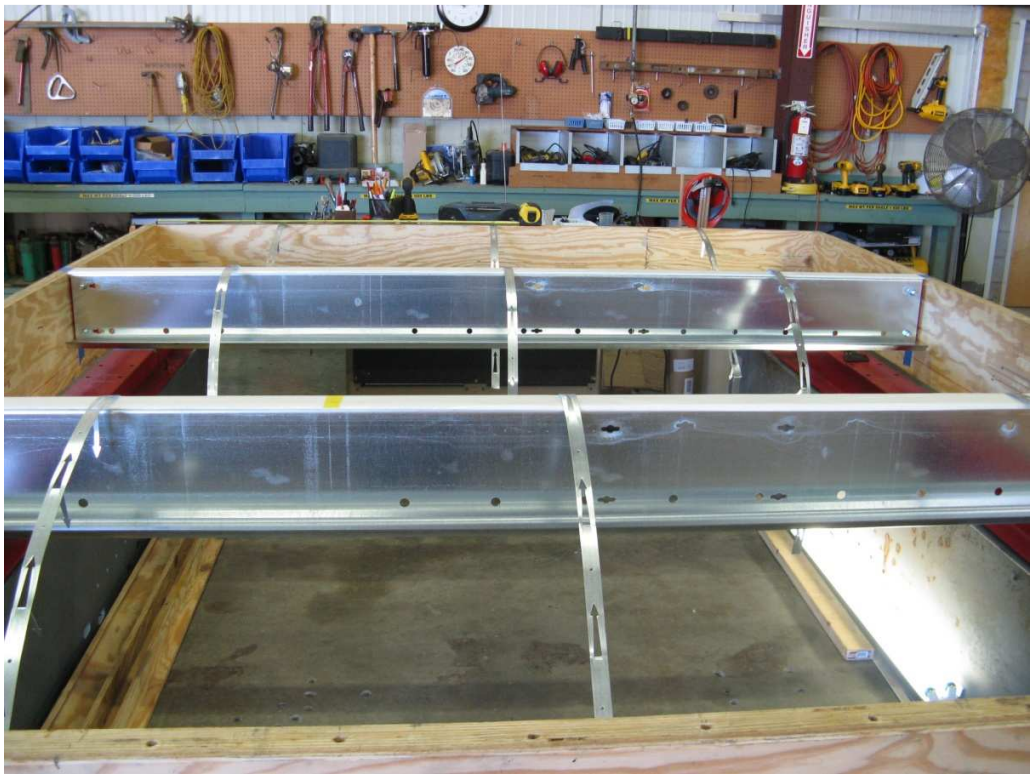

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